

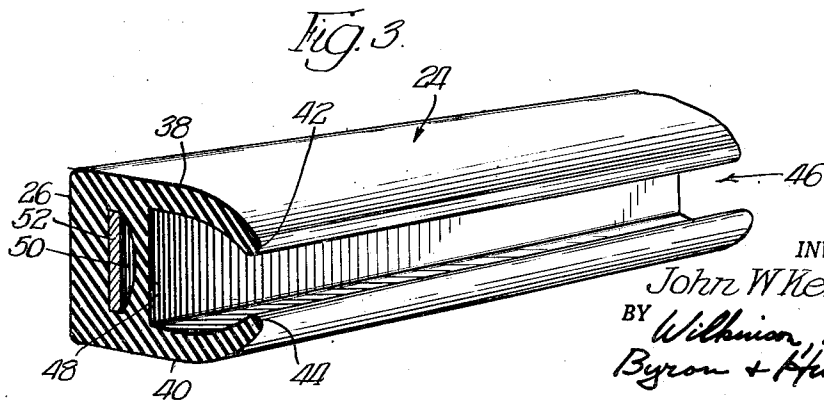
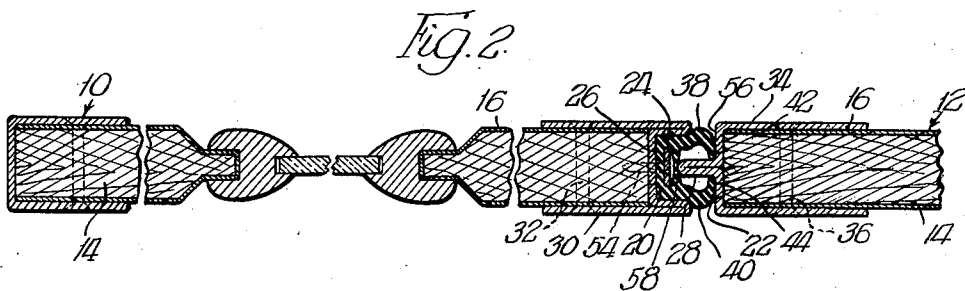
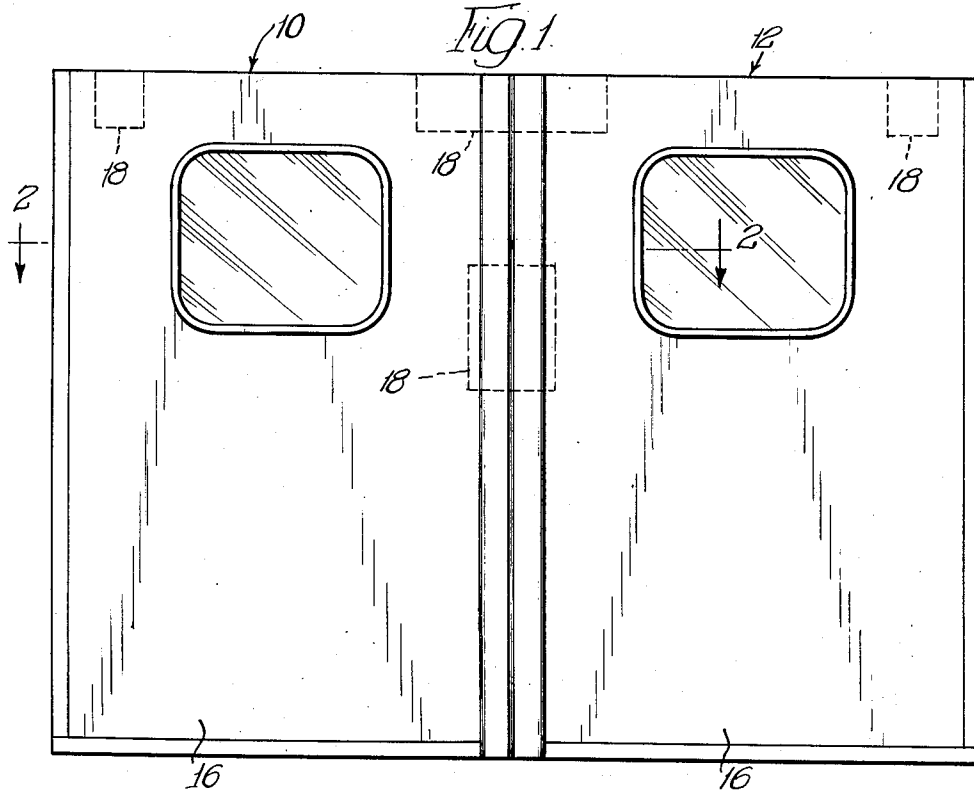
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SEALING ARRANGEMENT FOR SLIDING CLOSURES

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SEALING ARRANGEMENT FOR SLIDING CLOSURES

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This invention relates to a sealing arrangement for sliding closures, and more particularly to a sealing arrangement for sliding closures which have an edge adapted to be moved into sealing relation with a juxtaposed surface, which surface may be an edge of a second sliding closure or one of the edges of the opening being closed.

In other words, the sealing arrangement which is the object of this invention can be utilized with a single sliding closure which is adapted to be moved into abutment with one edge of the opening being closed, or may be used to form a seal between two sliding closures adapted to be moved into abutting relation at one edge thereof.

In some installations, a double sliding door is the most desirable form of closure, but the problem of providing a satisfactory sealing arrangement between the juxtaposed edges of such doors has been a limiting factor in the use of such an assembly. This type of door assembly is particularly useful, for example, in certain types of railroad cars, and the particular installation illustrated in the drawing accompanying this application is of such an assembly.

It is therefore an object of this invention to provide a sealing arrangement for sliding closures which is relatively simple in construction, but which produces a positive sealing action when used either as a sealing arrangement between the juxtaposed edges of two sliding closures, or when utilized with a single such closure to form a seal between an edge of the closure and an edge of the opening with which the closure is associated.

It is a further object to provide a sealing arrangement of the character described which provides a triple seal which is extremely difficult for undesirable elements such as wind or rain to penetrate, and in which the effectiveness of the sealing accomplished by the abutment of the various components in the assembly is greatly enhanced by providing for appropriate distortion of certain of these components, rather than requiring a compression thereof. A further object is therefore to provide a sealing assembly which will produce very efficient seal when only a relatively low pressure is applied to the various components by the edge of the one or more closures with which it is utilized.

Still another object is to provide a sealing arrangement of the character described having a convenient and effective means for positively securing the main portion of the assembly to the edge of the closure, and also to provide an arrangement in which several of the components, when the assembly is in the sealing position, form a natural drain and therefore prevent undesirable

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accumulation of moisture in the sealing assembly and in its associated parts.

Further objects and advantages of this invention will become evident as the description proceeds, and from an examination of the accompanying drawing which illustrates one embodiment of the invention and in which similar numerals refer to similar parts throughout the several views.

In the drawing:

Figure 1 is a plan view of two center-closing sliding doors adapted for use in a railroad baggage car or the like, the door assembly incorporating one embodiment of the sealing arrangement which is the subject matter of this invention;

Figure 2 is a fragmentary view in vertical cross-section of a portion of the two center-closing sliding doors and the sealing assembly associated therewith shown in Figure 1, the view being taken along the line 2—2 of Figure 1; and

Figure 3 is a perspective view of the strip of resilient sealing material which is secured to the right-hand edge of the door shown on the left in Figures 1 and 2.

Referring now to Figure 1, the two center-closing, sliding doors, indicated generally by the numerals 10 and 12, are a type particularly adapted for use on railroad baggage cars, or the like. As best shown in Figure 2, these doors may be constructed of plywood 14 having suitable metal sheeting 16 bonded thereto. Obviously, the doors could be formed of any other suitable material, however. Suitable metal inserts 18, shown in dotted lines in Figure 1, can be utilized to support the hangers and handles which may be required for a proper installation.

The two edges 20 and 22, as best shown in Figure 2, of the doors 10 and 12 respectively, are normally disposed in juxtaposed relation and are adapted to be moved into close association when the doors are closed. The strip of resilient sealing material, indicated generally by the numeral 24, having a substantially U-shaped cross-section, has its base 26 secured to the edge 20 of the door 10. Likewise, the edge 22 of the door 12 has the centrally disposed upstanding flange 28 associated therewith. These two elements, namely, the strip of resilient material 24 and the flange 28, are adapted to move into cooperative association when the juxtaposed edges 20 and 22 of the doors 10 and 12 are moved together to close the doors.

A double channel member 30 of substantially H-shaped cross-section may be provided which is adapted to receive the edge 20 of the door 10 in secured relation in one channel thereof. The

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channel member may be secured thereto by suitable holding means, such as the fastener 32. The channel member is also adapted to receive the base 26 of the resilient strip of sealing material in snugly fitting relation in the oppositely disposed channel.

The upstanding flange 28 may be formed as an integral part of a second channel member 34 which channel member, exclusive of the flange 28, has a substantially U-shaped cross-section. This channel member 34 is adapted to receive the edge 22 of the door 12 therein, and may be secured to this edge by a suitable holding means, such as the fastener 36. As previously stated, the flange 28 is centrally disposed on the base of the channel member 34 in projecting relation thereto, so that when the edge 22 is disposed in the channel member, as described, the flange 28 is centrally disposed with respect to the edge 22 of the door 12.

The strip of resilient sealing material 24 has a substantially U-shaped cross-section, the arms or lips 38 and 40 of the U being curved slightly inwardly, toward their outer extremities 42 and 44, as best shown in Figure 3. A channel 46 is formed by these arms 38 and 40 into which the flange 28 is adapted to be inserted as the two doors are closed. A deformable web 48 may be provided extending between the base of the arms 38 and 40, and disposed in spaced relation to the base 26 of the strip so as to form a longitudinal opening 50 between the base 26 and the web 48. The face of the web adjacent the base 26 may be given a concave configuration if desired, as best shown in Figure 3, to increase its deformable character.

An elongated strip of relatively non-resilient material, such as the metal strip 52, may be disposed in the longitudinal opening 50 to provide a suitable surface which the heads of holding means, such as the fastener 54 (Figure 2), may abut, and thus positively secure the base 26 of the resilient strip of sealing material 24 to the edge 20 of the door 10 in the outermost channel of the double channel member 30.

In operation, the arrangement described forms a very impervious seal between the two doors. The protruding flange 28 on the channel member 34 is so disposed that upon bringing the two edges 20 and 22 of the doors 10 and 12 together, it enters between the projecting arms or lips 38 or 40 of the strip of sealing material 24. As the edges of the two doors are moved into closer relation, the outer extremities 42 and 44 of the arms or lips 38 and 40 will be brought into abutment with the outer surface 56 of the base of the channel member 34, and at substantially the same time the outer end 58 of the flange 28 will be moved into abutment with the deformable web 48 extending between the arms 38 and 40.

Further movement of the two doors as described will cause the two arms 38 and 40 to be bent in the area adjacent their extremities 42 and 44 more sharply inwardly, as shown in Figure 2, so that a considerable area of their outer surfaces will abut the outer surface 56 of the channel member 34. Simultaneously, the outer extremities 42 and 44 of the strip 24 will normally be moved into abutment with the base of the flange 28.

At the same time, as the doors are moved into closer relation, the deformable web 48 will be distorted to an even greater degree by the outer end 58 of the flange 28, forming a very tight seal therebetween.

When the two doors are brought into the po-

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sition shown in Figure 2, so that the arm members 38 and 40 are collapsed in the manner described and the flange member 28 is brought into abutment with the web 48, any penetration through the seal so formed must follow a rather tortuous and difficult path. In order to pass through this sealing assembly, the path which must be followed, for example, passes first between the outer extremity 42 of one of the arm or lip members 38 and the outer surface 56 of the channel member 34. Then inwardly along the flange 28 and thence between the outer extremity 58 thereof and the web 48, which it abuts. Then back along the flange 28 and between the outer extremity 44 of the other arm 40 of the resilient strip 24 and the surface 56 of the flange member 34.

It will be seen that this path involves the passage between three sealed areas in addition to being very irregular.

The particular shape which has been given the arms or lips 38 and 40 on the sealing strip 24 adapts them to relatively easy distortion in the form of an inward bending action, and to thus form a seal, rather than by a compressive action. This is a distinct advantage, since the latter would require the application of a much greater force to achieve a comparable seal. This insures the attainment of a highly satisfactory seal with much smaller pressures than would otherwise be the case. Likewise the void, or opening, 50 formed between the web 48 and the base 26 of the sealing strip 24 permits the web 48 to be readily distorted inwardly by pressures which are relatively small, whereas if this area were not so constructed a much greater pressure would be necessary to achieve the same amount of sealing effect between the web 48 and the outer end 58 of the flange 28.

The particular configuration of the sealing strip 24 also causes this strip to form a natural drain when the doors are in the position shown in Figure 2, since a vertical passage is formed on each side of the protecting flange 28 between the flange and the arms 38 and 40. These vertical passages will ordinarily be more or less open at both their top and bottom extremities, and will thus cause any moisture which may collect on or in association with any of the elements of the sealing assembly to drain off rapidly.

The drawing and the above discussion are not intended to represent the only possible form of this invention, in regard to details of construction. Changes in form and in the proportion of parts, as well as the substitution of equivalents, are contemplated, as circumstances may suggest or render expedient, without departing from the spirit or scope of this invention, as further defined in the following claims.

What is claimed is:

1. A sealing arrangement for a sliding closure, which closure has an edge adapted to be moved into sealing relation with a juxtaposed surface comprising a strip of sealing material of substantially U-shaped cross-section adapted to have its base secured to said edge of said closure so that the arms of the U protrude outwardly therefrom, said base of said strip having a longitudinal opening therein so that the upper portion of said base is in the form of a deformable web, an upstanding flange member adapted to be disposed on said juxtaposed surface so as to be received between the arms of said strip and to abut said web when said edge is brought into close association with said juxtaposed surface,

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the outer extremities of said arms at the same time being adapted to abut said surface at the base of said flange member and to be bent slightly inwardly thereby so that the outer lateral surfaces of the extremities of said arms closely abut said juxtaposed surface. 5

2. A sealing arrangement for sliding closures of the character described in claim 1, further comprising an elongated strip of relatively non-resilient material disposed in said longitudinal opening in said base, said elongated strip being adapted to have fastening means inserted therein and through said base to secure the latter to said edge on which said sealing material is disposed. 10

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